# ECM-PNV (for Rev. C1 – Onboard 18bit LVDS)

**Intel® Atom™ D525 Dual-Core 3.5" Micro Module with Intel® ICH8-M Chipset**

# Quick Installation Guide

**1st Ed – 23 November 2010**

Part No. E2017383002R

## FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

## Copyright Notice

Copyright © 2010 Avalue Technology Inc., ALL RIGHTS RESERVED.

No part of this document may be reproduced, copied, translated, or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the prior written permission of the original manufacturer.

## Disclaimer

Avalue Technology Inc. reserves the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. Avalue Technology assumes no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. Avalue Technology Inc. makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

## Life Support Policy

Avalue Technology's PRODUCTS ARE NOT FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE PRIOR WRITTEN APPROVAL OF Avalue Technology Inc.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into body, or (b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

## A Message to the Customer

### *Avalue Customer Services*

Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

### *Technical Support*

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult the user's manual first.

To receive the latest version of the user's manual; please visit our Web site at:
http://www.avalue.com.tw/

# Content

**1. Getting Started ..... 5**
1.1 Safety Precautions ..... 5
1.1 Packing List ..... 5
**2. Hardware Configuration ..... 6**
2.1 Product Overview ..... 7
2.2 Jumper and Connector List ..... 8
2.3 Setting Jumpers & Connectors ..... 10
2.3.1 Clear CMOS (JBAT) ..... 10
2.3.2 Serial port 1 pin 9 signal select (JRI1) ..... 10
2.3.3 Touch panel mode select (JTOUCH_SEL) ..... 11
2.3.4 Miscellaneous setting connector (JFP) ..... 11
2.3.5 LCD backlight brightness adjustment (JVR) ..... 12
2.3.6 5VSB connector in ATX (PWR_SB) ..... 12
2.3.6.1 Signal Description –AT/ ATX mode & Input power type ..... 13
2.3.7 Battery connector (BAT) ..... 14
2.3.8 CPU fan connector (CPU_FAN) ..... 14
2.3.9 Serial port 1in RS-422/485 mode (J422/485_1) ..... 15
2.3.10 Audio connector (JAUDIO) ..... 15
2.3.11 Serial port 2 connector (JCOM2) ..... 16
2.3.12 General purpose I/O connector (JDIO) ..... 17
2.3.13 Touch panel connector (JTOUCH) ..... 18
2.3.14 SPI connector (JSPI) ..... 18
2.3.15 USB connector (JUSB2/ JUSB3) ..... 19
2.3.16 LVDS connector (JLVDS) ..... 20
2.3.17 LCD Inverter Connector (JBKL) ..... 21
2.3.18.1 Signal Description – LCD Inverter Connector (JBKL) ..... 21
2.3.18 Power connector (PWR) ..... 22
2.3.19 SATA power connector (S_PWR1) ..... 22
2.4 Audio / USB Daughter Board User's Guide ..... 23
2.4.1 Jumper and Connector Layout ..... 23
2.4.2 Jumper and Connector List ..... 23
2.4.3 Setting Jumper and Connector ..... 24

# 1. Getting Started

## 1.1 Safety Precautions

**Warning!**

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

**Caution!**

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

**Always note** that improper disassembling action could cause damage to the motherboard. We suggest not removing the heatsink without correct instructions in any circumstance. If you really have to do this, please contact us for further support.

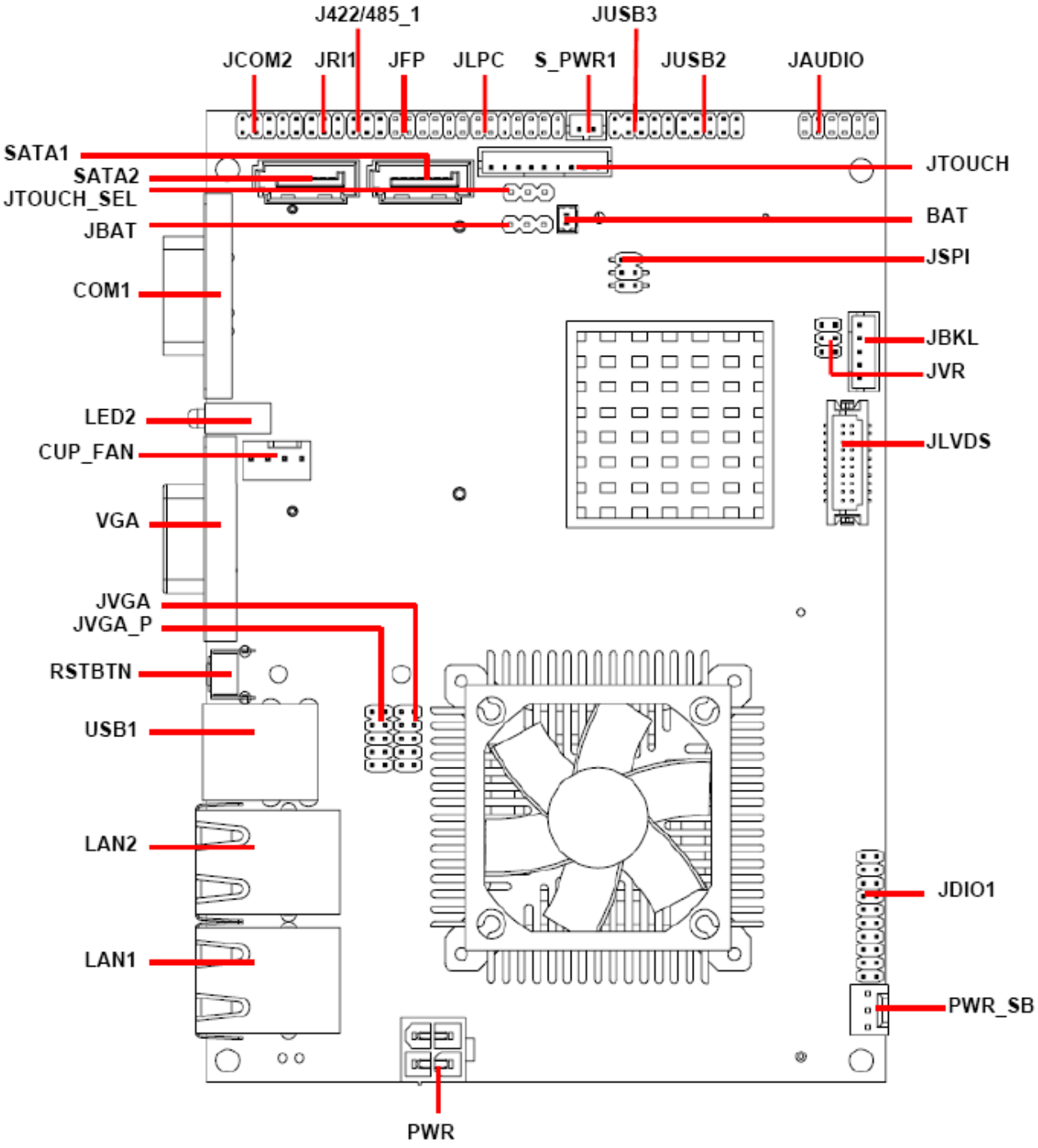
## 1.1 Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x 3.5” ECM-PNV Micro Module
- 1 x Quick Installation Guide for ECM-PNV
- 1 x AUX-032 daughter board
- 1 x DVD-ROM contains the followings:
  - User’s Manual (this manual in PDF file)
  - Ethernet driver and utilities
  - VGA drivers and utilities
  - Audio drivers and utilities
- 1 x Cable set contains the followings:
  - 1 x Audio cable (12pin, 2.0mm pitch)
  - 2 x USB cable (10P/2.54mm-10P/2.0mm)
  - 1 x Serial ATA cable (7-pin, standard)
  - 1 x Serial ATA cable (15-pin, 2P/2.0mm)
- 1 x CPU & North Bridge Cooler
- Onboard 18bit LVDS converter Board

# 2. Hardware Configuration

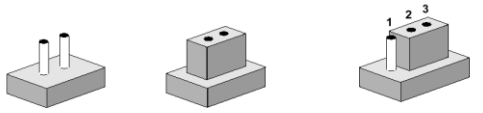
## 2.1 Product Overview



## 2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.




Open Closed Closed 2-3

The jumper settings are schematically depicted in this manual as follows:

Open Closed Closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board’s jumpers and connectors.

### Jumpers

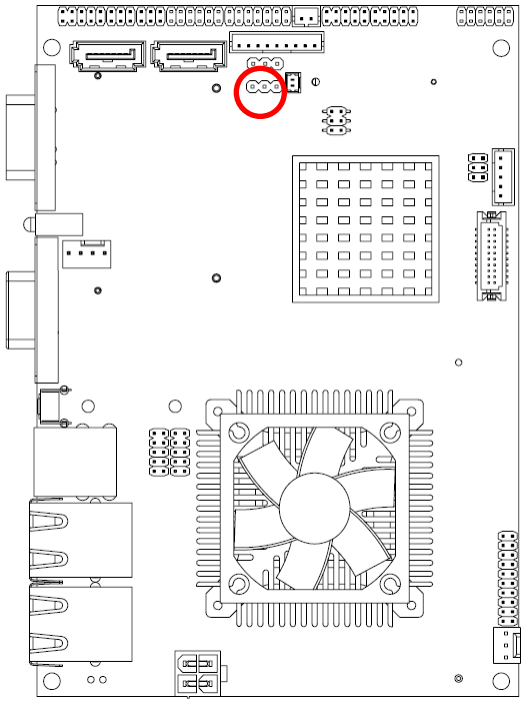
| Label | Function | Note |
|---|---|---|
| **JBAT** | Clear CMOS | 3 x 1 header, pitch 2.54 mm |
| **JFP** | Miscellaneous setting connector | 6 x 2 header, pitch 2.0 mm |
| **JRI1** | Serial port 1 pin 9 signal select | 3 x 2 header, pitch 2.0 mm |
| **JTOUCH_SEL** | Touch panel mode select | 3 x 1 header, pitch 2.54 mm |
| **JVR** | LCD backlight brightness adjustment | 3 x 2 header, pitch 2.0mm |

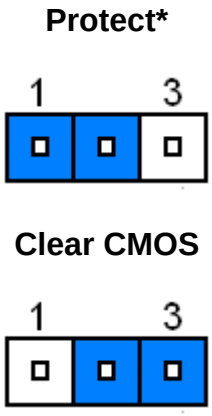
## Connectors

| Label | Function | Note |
|---|---|---|
| **BAT** | Battery connector | 2 x 1 wafer, pitch 1.25 mm |
| **COM1** | Serial port 1 connector | D-sub 9-pin, male |
| **CPU_FAN** | CPU fan connector | 3 x 1 wafer, pitch 2.54 mm |
| **J422/485** | Serial port 1 in RS-422/485 mode | 3 x 2 header, pitch 2.0 mm |
| **JTOUCH** | Touch panel connector | 9 x 1 header, pitch 2.0 mm |
| **JAUDIO** | Audio connector | 6 x 2 header, pitch 2.0 mm |
| **JCOM2** | Serial port 2 connector | 5 x 2 header, pitch 2.0 mm |
| **JDIO** | General purpose I/O connector | 10 x 2 header, pitch 2.0 mm |
| **JLPC** | (Reserved for debug) | 7 x 2 header, pitch 2.0 mm |
| **JSPI** | SPI connector | 3 x 2 header, pitch 2.0 mm |
| **JUSB2** | USB connector | 5 x 2 header, pitch 2.0 mm |
| **JUSB3** | USB connector | 5 x 2 header, pitch 2.0 mm |
| **JLVDS1** | LVDS connector | 2 x 20 header, pitch 1.25mm |
| **JBKL** | LCD inverter connector | 5 x 1 wafer, pitch 2.0mm |
| **LAN1** | RJ-45 Ethernet connector | |
| **LAN2** | RJ-45 Ethernet connector | |
| **LED2** | LED connector | |
| **PWR** | Power connector | 2 x 2 wafer, pitch 4.2 mm |
| **PWR_SB** | 5VSB connector in ATX | 3 x 1 wafer, pitch 2.54 mm |
| **S_PWR1** | SATA power connector | 2 x 1 wafer, pitch 2.0 mm |
| **SATA1** | Serial ATA connector 1 | |
| **SATA2** | Serial ATA connector 2 | |
| **RSTBTN** | Reset button | |
| **USB1** | USB connector | Double Deck |
| **VGA** | VGA connector | D-sub 15-pin, female |

## 2.3 Setting Jumpers & Connectors

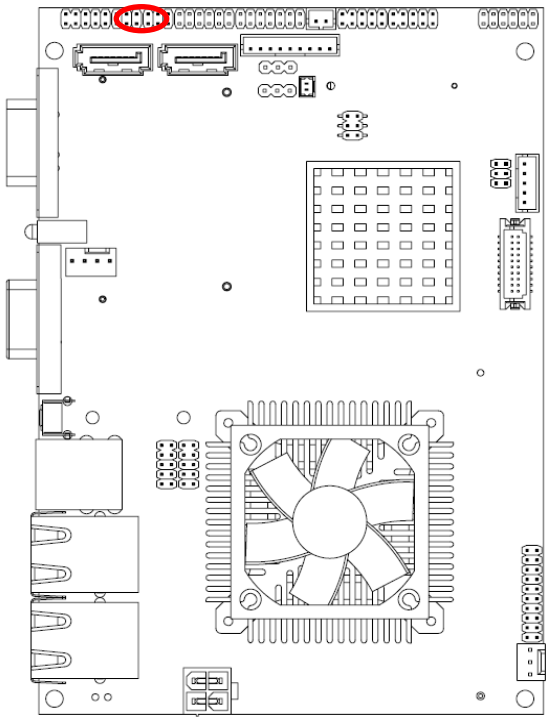
### 2.3.1 Clear CMOS (JBAT)

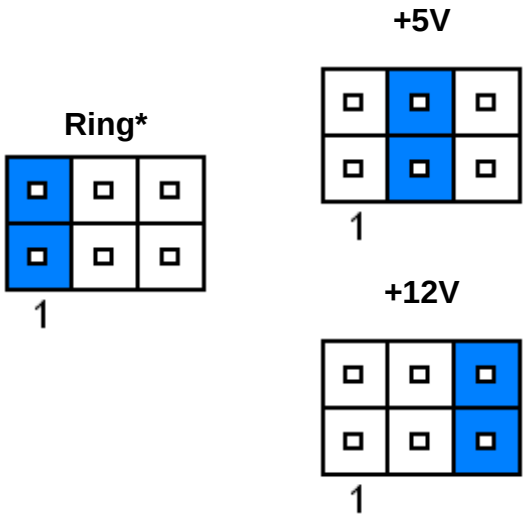





*** Default**

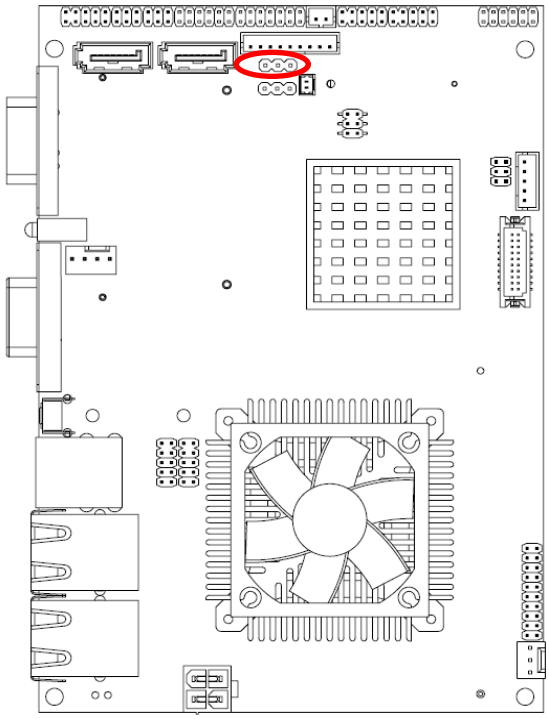
### 2.3.2 Serial port 1 pin 9 signal select (JRI1)

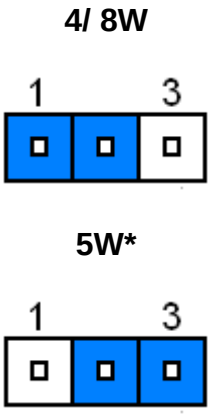





*** Default**

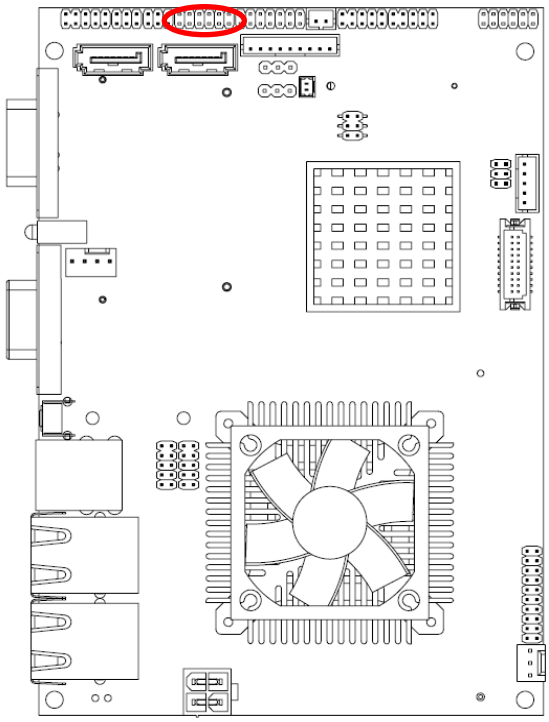
### 2.3.3 Touch panel mode select (JTOUCH_SEL)

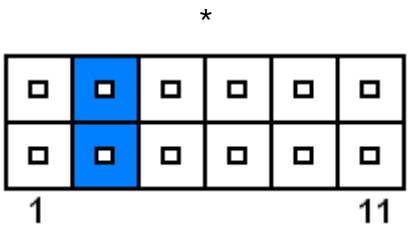





*** Default**

### 2.3.4 Miscellaneous setting connector (JFP)

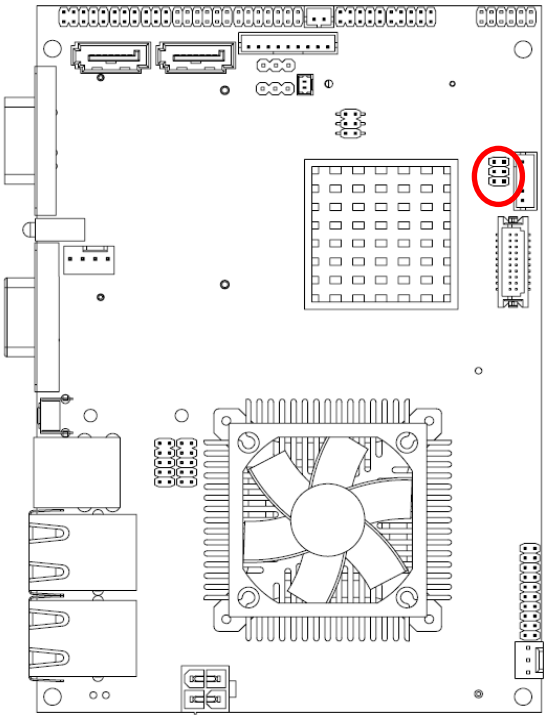


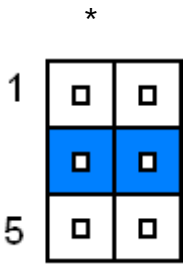



| Signal | PIN | PIN | Signal |
|---|---|---|---|
| PWRBTN# | 1 | 2 | GND |
| PWRBTN# | 3 | 4 | AUTO_PWR_ON |
| VCC | 5 | 6 | GND |
| HD_ACT# | 7 | 8 | VCC3 |
| VCC | 9 | 10 | GND |
| COPEN# | 11 | 12 | GND |

*** Default**

### 2.3.5 LCD backlight brightness adjustment (JVR)

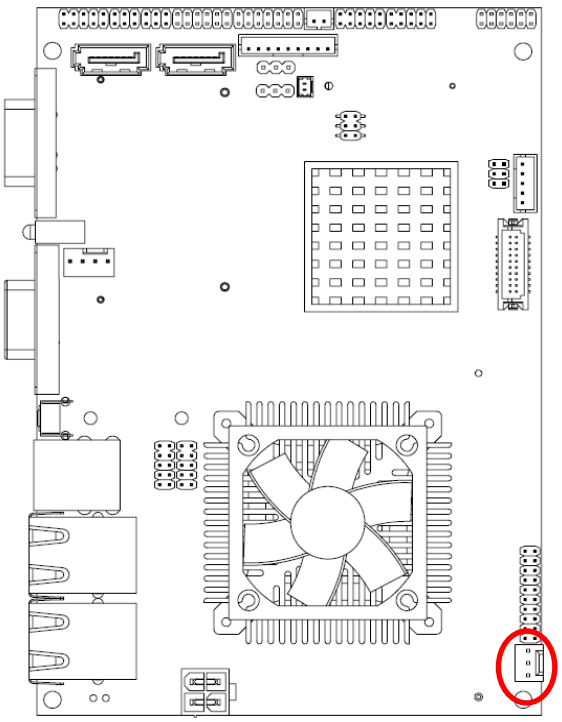


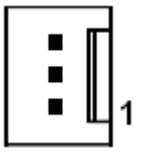



| Signal | PIN | PIN | Signal |
|---|---|---|---|
| +5V | 1 | 2 | DA1 |
| BRIGHT | 3 | 4 | BRIGHT |
| GND | 5 | 6 | PWM1 |

***Default**

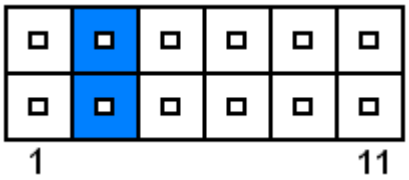
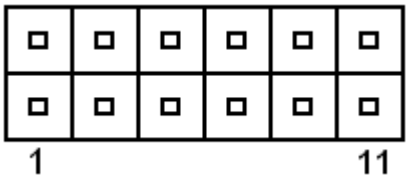
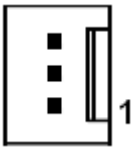
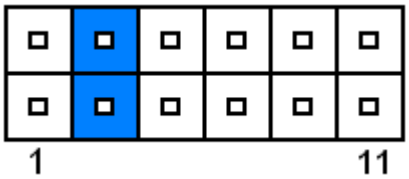
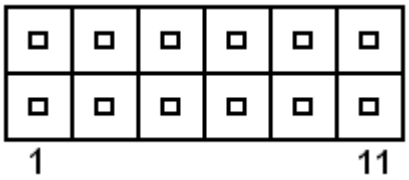
### 2.3.6 5VSB connector in ATX (PWR_SB)



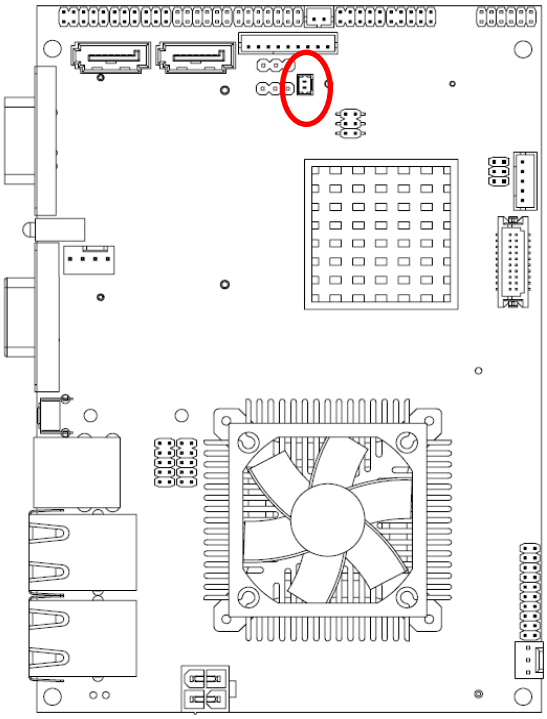


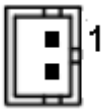

| Signal | PIN |
|---|---|
| ATX5VSB | 3 |
| GND | 2 |
| PSON | 1 |

### 2.3.6.1 Signal Description –AT/ ATX mode & Input power type

| Input power type | Power-ON Mode | Description |
|---|---|---|
| **AT Type** | **AT Mode**<br>(PWR MSEL)<br>  <br> | Use AT type power input, and set the board in AT mode. |
| | **ATX Mode**<br>(PWR MSEL)<br>  <br> | Use AT type power input, and set the board in ATX mode. |
| **ATX Type**<br>(PWR_SB)<br>  <br> | **AT Mode**<br>(PWR MSEL)<br>  <br> | Use ATX type power input, and set the board in AT mode. |
| | **ATX Mode**<br>(PWR MSEL)<br>  <br> | Use ATX type power input, and set the board in ATX mode. |

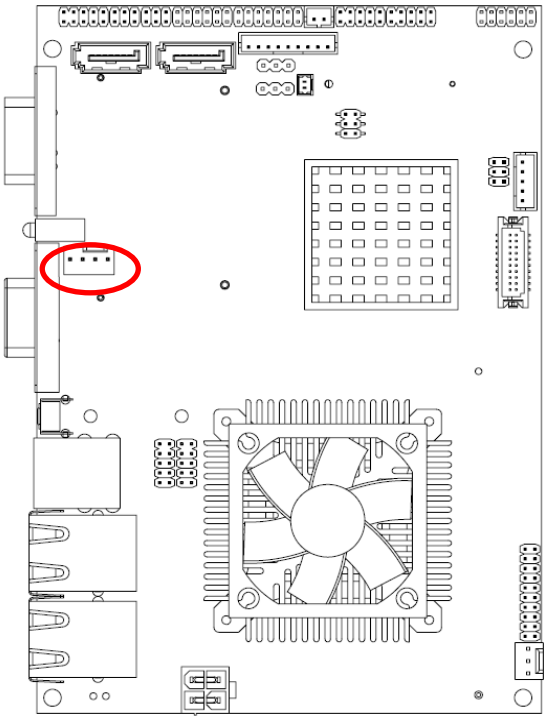
### 2.3.7 Battery connector (BAT)

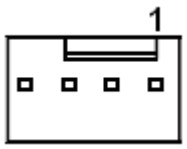





| Signal | PIN |
|---|---|
| BAT | 1 |
| GND | 2 |

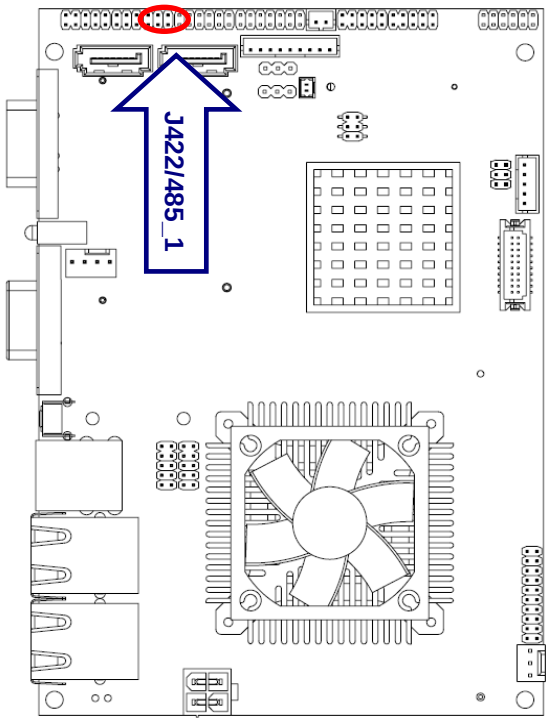
### 2.3.8 CPU fan connector (CPU_FAN)



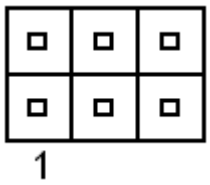



| Signal | PIN |
|---|---|
| GND | 1 |
| VCC12 | 2 |
| FAN_TAC1 | 3 |
| FAN_CTL1 | 4 |

### 2.3.9 Serial port 1in RS-422/485 mode (J422/485_1)




**J422/485_1**

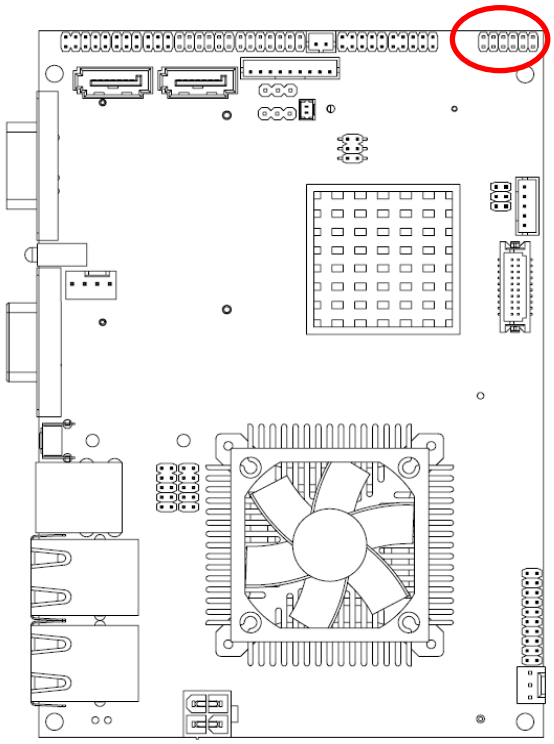


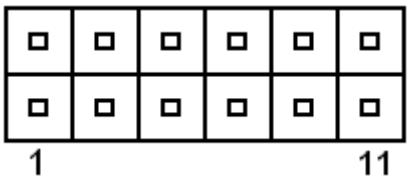

| Signal | PIN | PIN | Signal |
|---|---|---|---|
| TX- | 1 | 2 | RX- |
| TX+ | 3 | 4 | RX+ |
| +5V | 5 | 6 | GND |

Note:

J422/485 is available after modifying the mode of COM2 in BIOS setting.

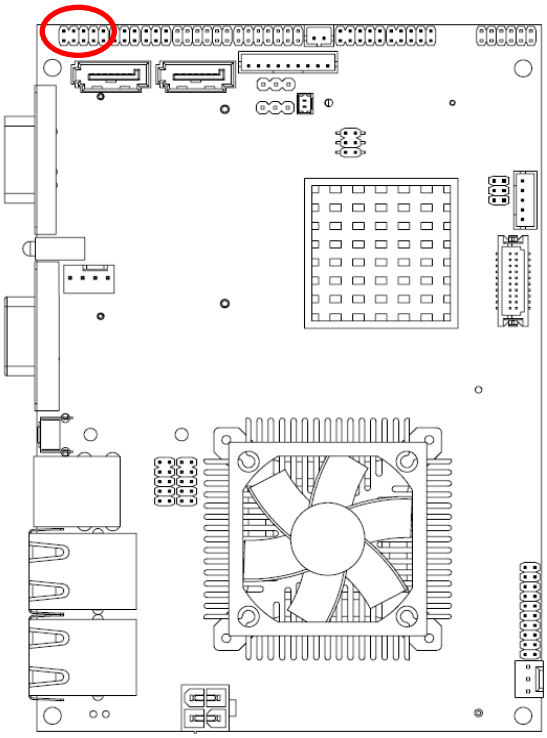
### 2.3.10 Audio connector (JAUDIO)

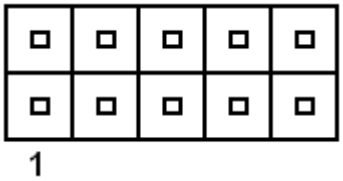





| Signal | PIN | PIN | Signal |
|---|---|---|---|
| LINEOUT_R | 1 | 2 | LINEOUT_L |
| GND | 3 | 4 | GND |
| LINEIN_R | 5 | 6 | LINEIN_L |
| MIC-R | 7 | 8 | MIC-L |
| FRONT-JD | 9 | 10 | LINE1-JD |
| MIC1-JD | 11 | 12 | GND |

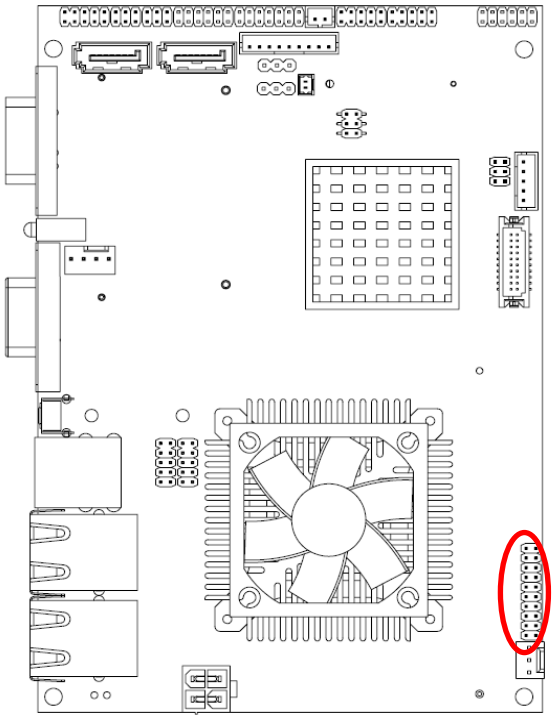
### 2.3.11 Serial port 2 connector (JCOM2)

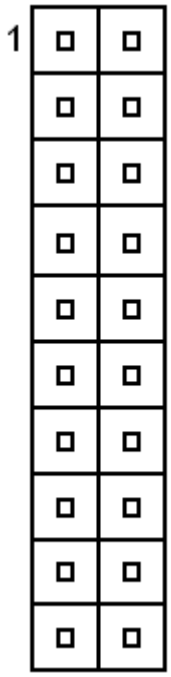





| Signal | PIN | PIN | Signal |
|---|---|---|---|
| DCD2 | 1 | 2 | RxDD2 |
| TxDD2 | 3 | 4 | DTR2 |
| GND | 5 | 6 | DSR2 |
| RTS2 | 7 | 8 | CTS2 |
| RI2 | 9 | 10 | NC |

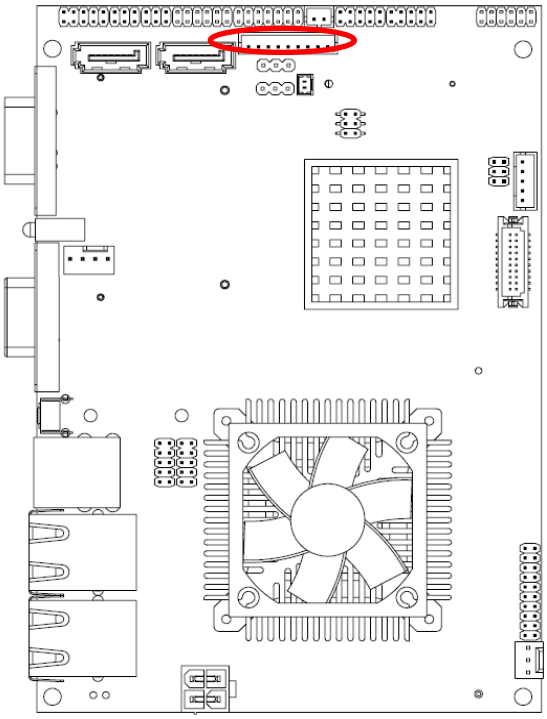
### 2.3.12 General purpose I/O connector (JDIO)

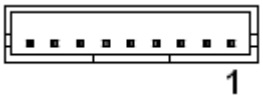





| Signal | PIN | PIN | Signal |
|---|---|---|---|
| DIO0 | 1 | 2 | DIO10 |
| DIO1 | 3 | 4 | DIO11 |
| DIO2 | 5 | 6 | DIO12 |
| DIO3 | 7 | 8 | DIO13 |
| DIO4 | 9 | 10 | DIO14 |
| DIO5 | 11 | 12 | DIO15 |
| DIO6 | 13 | 14 | DIO16 |
| DIO7 | 15 | 16 | DIO17 |
| SMB_CLK | 17 | 18 | SMB_DATA |
| GND | 19 | 20 | +5V |

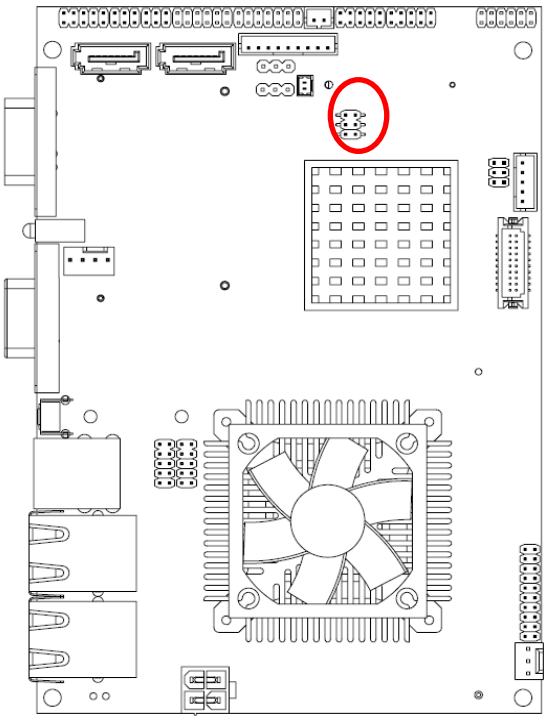
### 2.3.13 Touch panel connector (JTOUCH)

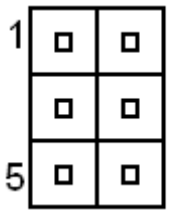





| PIN | 4-WIRE | 5-WIRE | 8-WIRE |
|---|---|---|---|
| 1 | N/A | N/A | Right Sense |
| 2 | N/A | N/A | Left Sense |
| 3 | N/A | N/A | Bottom Sense |
| 4 | N/A | Sense | Top Sense |
| 5 | Right | LR | Right Excite |
| 6 | Left | LL | Left Excite |
| 7 | Bottom | UR | Bottom Excite |
| 8 | Top | UL | Top Excite |
| 9 | GND | GND | GND |

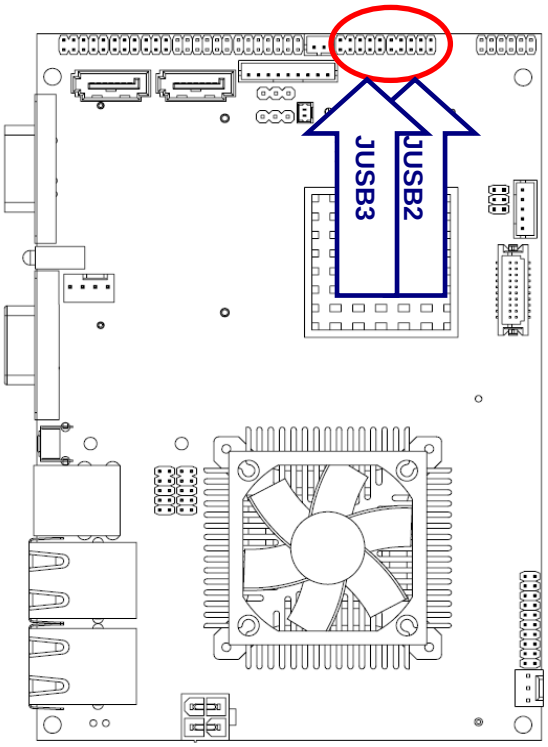
### 2.3.14 SPI connector (JSPI)

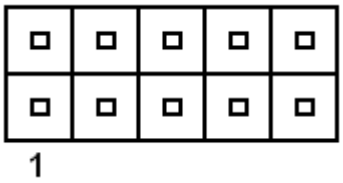





| Signal | PIN | PIN | Signal |
|---|---|---|---|
| VSPI | 1 | 2 | GND |
| SPICE# | 3 | 4 | SPISCK |
| SPISO | 5 | 6 | SPISI |

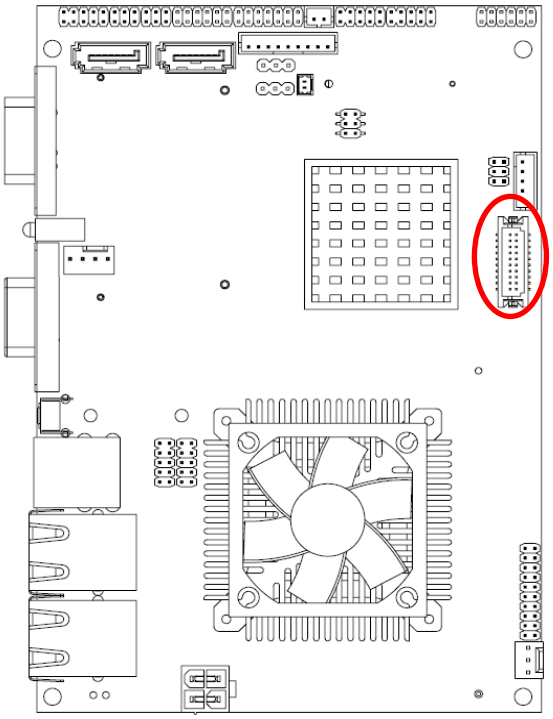
### 2.3.15 USB connector (JUSB2/ JUSB3)

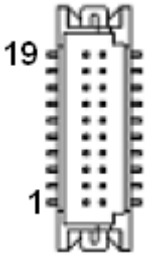



| Signal | PIN | PIN | Signal |
|---|---|---|---|
| +5V | 1 | 2 | GND |
| N3/ N7 | 3 | 4 | GND |
| P3/ P7 | 5 | 6 | P2/ P6 |
| GND | 7 | 8 | N2/ N6 |
| GND | 9 | 10 | +5V |

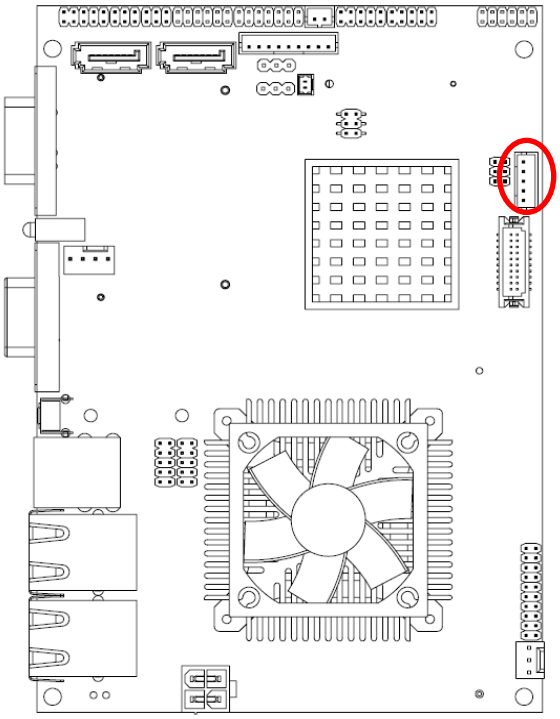
### 2.3.16 LVDS connector (JLVDS)



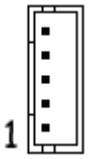



| Signal | PIN | PIN | Signal |
|---|---|---|---|
| VCC3_LVDS | 19 | 20 | VCC_LVDS |
| VCC3_LVDS | 17 | 18 | VCC_LVDS |
| I_SDA | 15 | 16 | I_SCL |
| GND | 13 | 14 | GND |
| LVDS_CLK+ | 11 | 12 | LVDS_CLK- |
| NC | 9 | 10 | NC |
| LVDS_2+ | 7 | 8 | LVDS_2- |
| LVDS_1+ | 5 | 6 | LVDS_1- |
| LVDS_0+ | 3 | 4 | LVDS_0- |
| GND | 1 | 2 | GND |

### 2.3.17 LCD Inverter Connector (JBKL)



**JBKL**



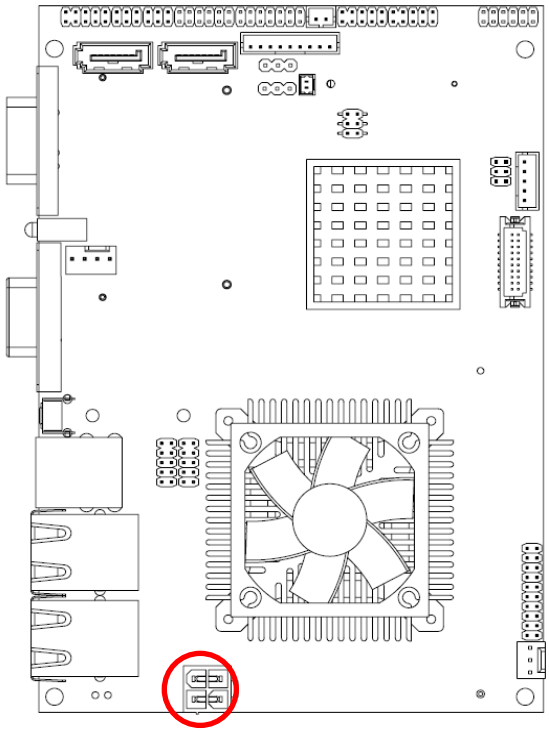

| Signal | PIN |
|---|---|
| +12V | 1 |
| GND | 2 |
| BLK_ON | 3 |
| BRIGHT | 4 |
| +5V | 5 |

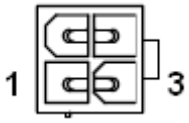
**Note:**
For inverters with adjustable Backlight function, it is possible to control the LCD brightness through the VR signal controlled by **JVR**. Please see the **JVR** section for detailed circuitry information.

### 2.3.18.1 Signal Description – LCD Inverter Connector (JBKL)

| Signal | Signal Description |
|---|---|
| BRIGHT | Vadj = 0.75V ~ 4.25V (Recommended: 4.7KΩ, >1/16W) |
| BKL_ON | LCD backlight ON/OFF control signal |

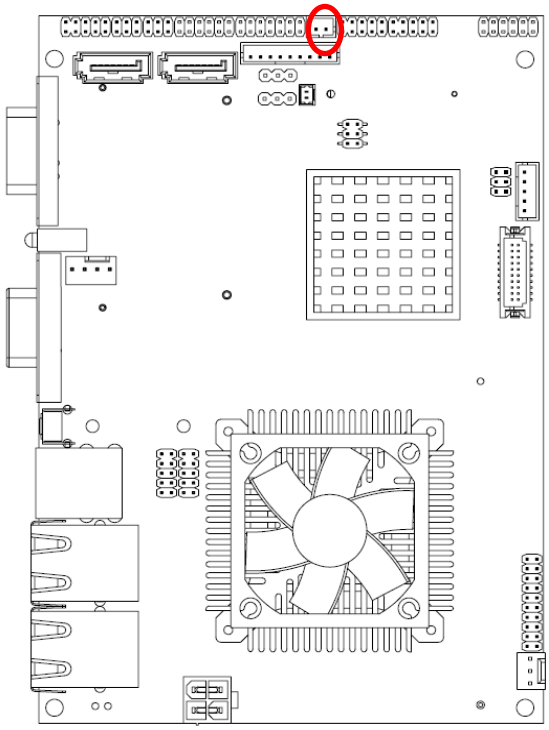
### 2.3.18 Power connector (PWR)

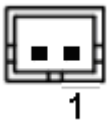





| Signal | PIN | PIN | Signal |
|---|---|---|---|
| GND | 2 | 4 | VIN |
| GND | 1 | 3 | VIN |

### 2.3.19 SATA power connector (S_PWR1)





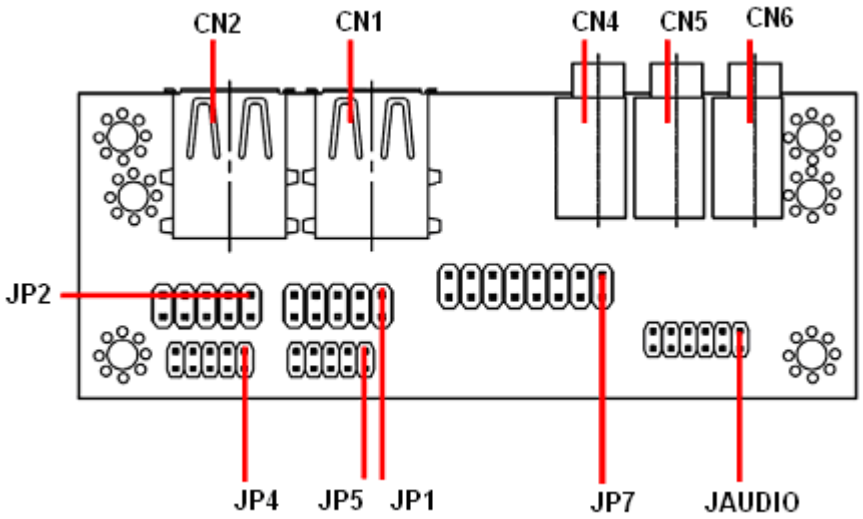

| Signal | PIN |
|---|---|
| SATA_PWR | 2 |
| GND | 1 |

**Note:**

SATA_PWR is _+5V for SATA DOM uses

## 2.4 Audio / USB Daughter Board User's Guide

### 2.4.1 Jumper and Connector Layout




### 2.4.2 Jumper and Connector List

**Connectors**

| Label | Function | Note |
|---|---|---|
| **CN1, CN2** | USB connector | |
| **CN4** | Line out connector | Phone Jack |
| **CN5** | Line in connector | Phone Jack |
| **CN6** | Mic in connector | Phone Jack |
| **JAUDIO** | Audio connector | 6 x 2 header, pitch 2.0mm |
| **JP1** | 2.54mm USB connector | 5 x 2 header, pitch 2.54mm |
| **JP2** | 2.54mm USB connector | 5 x 2 header, pitch 2.54mm |
| **JP4** | 2.0mm USB connector | 5 x 2 header, pitch 2.0mm |
| **JP5** | 2.0mm USB connector | 5 x 2 header, pitch 2.0mm |
| **JP7** | TV / Audio connector | 8 x 2 header, pitch 2.54mm |

## 2.4.3 Setting Jumper and Connector

### Audio Connector (JAUDIO)

| Signal | PIN | PIN | Signal |
|---|---|---|---|
| OUTR | 1 | 2 | OUTL |
| GND | 3 | 4 | GND |
| INR1 | 5 | 6 | INL1 |
| MICIN1 | 7 | 8 | AREF |
| FRONT-JD1 | 9 | 10 | LINE1-JD1 |
| MIC1-JD1 | 11 | 12 | GND |

### 2.54mm USB Connector (JP1)

| Signal | PIN | PIN | Signal |
|---|---|---|---|
| +5V | 1 | 2 | GND |
| D1- | 3 | 4 | GND |
| D1+ | 5 | 6 | D2+ |
| GND | 7 | 8 | D2- |
| GND | 9 | 10 | +5V |

**Note:** Wrong USB cable configuration with your USB devices might damage your USB devices.

### 2.54mm USB Connector (JP2)

| Signal | PIN | PIN | Signal |
|---|---|---|---|
| +5V | 1 | 2 | GND |
| D3- | 3 | 4 | GND |
| D3+ | 5 | 6 | D4+ |
| GND | 7 | 8 | D4- |
| GND | 9 | 10 | +5V |

### TV / Audio Connector (JP7)

| Signal | PIN | PIN | Signal |
|---|---|---|---|
| Mic In | 1 | 2 | Mic Bais |
| GND | 3 | 4 | GND |
| Line out L | 5 | 6 | Line out R |
| SPK L | 7 | 8 | SPK R |
| Line in L | 9 | 10 | Line in R |
| GND | 11 | 12 | NC |
| TVGND | 13 | 14 | NC |
| TVGND | 15 | 16 | COMP |

### 2.0mm USB Connector (JP4)

| Signal | PIN | PIN | Signal |
|---|---|---|---|
| +5V | 1 | 2 | GND |
| D3- | 3 | 4 | GND |
| D3+ | 5 | 6 | D4+ |
| GND | 7 | 8 | D4- |
| GND | 9 | 10 | +5V |

### 2.0mm USB Connector (JP5)

| Signal | PIN | PIN | Signal |
|---|---|---|---|
| +5V | 1 | 2 | GND |
| D1- | 3 | 4 | GND |
| D1+ | 5 | 6 | D2+ |
| GND | 7 | 8 | D2- |
| GND | 9 | 10 | +5V |